Application Number: 10/642,680

Filing Date: August 19, 2003

Attorney Docket Number: 04329.3115

**AMENDMENTS TO THE CLAIMS:** 

Please amend claims 1-4, 6, and 8-12 as indicated below. This listing of claims will

replace all prior versions and listings of claims in the application:

**LISTING OF CLAIMS:** 

1. (Currently Amended) A method for creating charged-particle-beam exposure data

containing a description of an exposure sequence of character patterns in a deflection region of a

specimen to perform exposure of a charged particle beam according to a character projection

technique, comprising:

selecting first or second values as a parameter to transfer one character pattern and then

transferring a subsequent character pattern, the first value regarding performance of a shaping

deflector which deflects the charged particle beam so that the charged particle beam is applied to

an arbitrarily character aperture formed in a CP (character projection) aperture mask and a

character beam having the shape of the character aperture is thereby created, and the second

value regarding performance of an objective deflector which deflects the character beam so that

the character beam is applied to an arbitrarily position of the deflection region of the specimen;

and

determining the exposure sequence of the character patterns in the deflection region in

accordance with the selected parameter.

2. (Currently Amended) The method for creating charged-particle-beam exposure data

according to claim 1, wherein

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a settling time of the shaping deflector is compared with a settling time of the objective deflector <u>for each character pattern</u>, and a longer one of the settling times is selected as the parameter <u>for said each character pattern</u>; and

[[to]] when performing exposures of all character patterns in the deflection region, [[an]] the exposure sequence of the character patterns is determined so that [[the]] a sum of selected settling times for said all character patterns is minimum.

- 3. (Currently Amended) The method for creating charged-particle-beam exposure data according to claim 2, wherein the exposure sequence of the character patterns is determined by using a "traveling salesman problem" solution algorithm so that [[the]] a sum of selected settling times for said all character patterns is minimum.
- 4. (Currently Amended) The method for creating charged-particle-beam exposure data according to claim 1, wherein

the correlation between a deflection distance of the charged particle beam deflected <u>by</u> the shaping deflector on the CP aperture mask and a deflection distance of the character beam deflected by the objective deflector on the specimen is obtained;

in a case where two character patterns are sequentially transferred, when a first deflection distance of the beam deflected by one of the shaping deflector and the objective deflector and a deflection distance of the beam deflected by the other deflector and a second deflection distance converted to the deflection distance of the beam deflected by the one deflector are compared with each other in accordance with the correlation, a longer one of the deflection distances is selected as the parameter; and

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[[to]] when performing exposures of all character patterns in the deflection region, [[an]]

the exposure sequence of the character patterns is determined so that [[the]] a sum of selected

deflection distances for said all character patterns is minimum.

5. (Original) The method for creating charged-particle-beam exposure data according to

claim 4, wherein the correlation is obtained in accordance with the settling times of the shaping

deflector and the objective deflector.

6. (Currently Amended) The method for creating charged-particle-beam exposure data

according to claim 4, wherein the exposure sequence of the character patterns is determined by

using a "traveling salesman problem" solution algorithm so that [[the]] a sum of selected

deflection distances for said all character patterns is minimum.

7. (Original) A method for manufacturing a semiconductor device, wherein a

charged-particle-beam exposure of a semiconductor device pattern is performed by using

exposure data created in accordance with the method for creating charged-particle-beam

exposure data defined in claim 1.

8. (Currently Amended) A program for implementing a function of creating exposure

data containing a description of an exposure sequence of character patterns in a deflection region

of a specimen to perform exposure of a charged particle beam according to a character projection

technique, the program comprising:

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a function that works such that first or second values is selected as a parameter to transfer one character pattern and then transferring a subsequent character pattern, the first value regarding performance of a shaping deflector which deflects the charged particle beam so that the charged particle beam is applied to an arbitrarily character aperture formed in a CP character projection) aperture mask and a character beam having the shape of the character aperture is thereby created, and the second value regarding performance of an objective deflector which deflects the character beam so that the character beam is applied to an arbitrarily position of the deflection region of the specimen; and

a function that works such that the exposure sequence of the character patterns in the deflection region is determined in accordance with the selected parameter.

9. (Currently Amended) The program according to claim 8, wherein

a settling times time of the shaping deflector is compared with a settling time of the objective deflector for said character pattern, and a longer one of the settling times is selected as the parameter for said each character pattern; and

when performing exposures of all character patterns in the deflection region, [[an]] the exposure sequence of the character patterns is determined so that [[the]] a sum of selected settling times for said all character patterns is minimum.

10. (Currently Amended) The program according to claim 9, wherein the exposure sequence of the character patterns is determined by using a "traveling salesman problem" solution algorithm so that [[the]] <u>a</u> sum of selected settling times <u>for said all character patterns</u> is minimum.

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11. (Currently Amended) The program according to claim 8, wherein

the correlation between a deflection distance of the charged particle beam deflected <u>by</u> the shaping deflector on the CP aperture mask and a deflection distance of the character beam deflected by the objective deflector on the specimen is obtained;

in a case where two character patterns are sequentially transferred, when a first deflection distance of the beam deflected by one deflector and a deflection distance of the beam deflected by an other deflector and a second deflection distance converted to the deflection distance deflected by the one deflector are compared with each other in accordance with the correlation, a longer one of the deflection distances is selected as the parameter; and

when performing exposures of all character patterns in the deflection region, [[an]] the exposure sequence of the character patterns is determined so that [[the]] <u>a</u> sum of selected deflection distances <u>for said all character patterns</u> is minimum.

12. (Currently Amended) The program according to claim 11, wherein the exposure sequence of the character patterns is determined by using a "traveling salesman problem" solution algorithm so that [[the]] a sum of selected deflection distances <u>for said all character patterns</u> is minimum.